

cont'd
C3

a second connector installed on the portable radio terminal communication with said external [apparatus] power when connected with said first connector.--

REMARKS

This application has been reviewed in light of the Office Action dated May 27, 1999. By the present amendment, claims 1, 7, and 17-19 have been amended. Claims 1-5, 7-10, and 16-19 are pending in this application, with claims 1, 7, and 17-19 being in independent form. It is submitted that no new matter has been added by the present amendment.

The drawings were objected to under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Submitted herewith is a Letter With Proposed Drawing Changes in which the second antenna or external antenna is shown in Figs. 1, 4, 11A, and 11B. This antenna is referred to throughout the original specification, as well as in the original claims, so that the proposed showing in the drawing simply conforms to the original specification and claims. Thus, it is respectfully submitted that the changes involve no new matter. It is also proposed to amend

the specification to refer to the second antenna or external antenna as " 2' ", as shown in amended Figs. 1, 4, 11A, and 11B. Withdrawal of the objection is respectfully requested.

Reconsideration is respectfully requested of the rejection of claim 19 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The claims have been carefully reviewed and amended with particular attention to the points raised in the Office Action. Withdrawal of the rejection under Section 112, second paragraph, is respectfully requested.

Reconsideration is respectfully requested of the rejection of claims 1 and 4 under 35 U.S.C. 102(b), as being anticipated by the Prior Art shown in Fig. 1.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that amended independent claim 1 is patentable over the Prior Art (Fig. 1) for at least the following reasons.

As described in amended independent claim 1, Applicants' invention relates to an antenna coupling apparatus. A first antenna is connected to a portable radio terminal, the first

antenna being elongated in an axial direction. A second antenna is separated from the first antenna. An electromagnetic coupling element consisting of a conductor that electromagnetically couples the first and the second antennas together is arranged adjacent to the first antenna at a first location along the axial direction of the first antenna. A ground conductor element is arranged proximate said first antenna. A reflective ground element is arranged adjacent to the first antenna and is disposed on the ground conductor element physically in parallel with and a predetermined distance from the electromagnetic coupling element along the first antenna in the axial direction for reflecting power transmitted from or received by the first antenna toward the electromagnetic coupling element.

The prior art shown in Fig. 1 relates to an antenna coupling apparatus 1 comprising a ring-shaped electromagnetic coupling element 2 and a transmission cable 3. The electromagnetic coupling element 2 is connected to the core of the transmission cable 3 and to a ground conductor 4 through a nonconducting member. The antenna 6 disposed on a portable radio terminal 5 such as a portable phone is inserted into the electromagnetic coupling element 2.

It is respectfully submitted that the antenna coupling apparatus of the Prior Art shown in Fig. 1 is different from Applicant's invention as recited in amended independent claim 1 for at least the following reasons.

The prior art of Fig. 1 does not show a reflective ground element, as shown, for example, in Fig. 4 referenced by numeral 21. The reflective ground element reflects some of the power unnecessarily emitted from the antenna connected to the portable radio terminal toward the electromagnetic coupling element. Therefore, unnecessarily emitted power and transmission loss are reduced, compared with conventional portable radio terminals, such as the one shown in Fig. 1.

Applicant has amended claim 1 to more clearly recite that the reflective ground element is arranged adjacent to the first antenna and disposed on the ground conductor element physically in parallel with and a predetermined distance from the electromagnetic coupling element along the first antenna in the axial direction for reflecting power transmitted from or received by the first antenna toward the electromagnetic coupling element.

Accordingly, Applicant submits that claims 1 and 4 are patentably distinct over the Prior Art shown in Fig. 1.

Reconsideration is respectfully requested of the rejection of claims 1-5, 7-10, and 17-19 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,557,287 to Pottala et al.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that amended independent claims 1, 7, and 17-19 are patentable over the cited reference for at least the following reasons.

Pottala et al., as understood by Applicant, relates to a self-latching antenna field coupler. The coupler includes two housing members, one being movable relative to the other between a first position to define an antenna receiving channel and a second position to define a secured antenna chamber. A latch actuator is mechanically coupled to the movable housing member to automatically move the movable housing member from the first position to the second position when an antenna is received in the antenna receiving channel.

The Examiner states that Pottala et al. shows in Fig. 2 a ground conductor element 230 arranged proximate the first antenna 195. The Examiner also states that Pottala et al. shows a reflective ground element 210, 230 arranged adjacent to the first antenna 195 and disposed a predetermined distance

from the electromagnetic coupling element 240 along the first antenna 195 in the axial direction for reflecting power transmitted from or received by the first antenna toward the electromagnetic element.

As made clearer by the amended claims, the ground conductor element and the reflective ground element in Applicant's invention are separate elements. Specifically, the reflective ground element in Applicant's claimed invention is arranged adjacent to the first antenna and is disposed on the ground conductor element physically in parallel with and a predetermined distance from the electromagnetic coupling element along the first antenna in the axial direction. This clearly shows that the reflective ground element is an element separate and distinct from the ground conductor element.

In Pottala et al., reference numerals 230 and 210 represent two housing members. These housing members come together to wrap around the antenna 195, thereby forming a single member as shown in Fig. 3.

Furthermore, Pottala et al. shows an entirely different antenna-coupling apparatus. The Examiner refers to housing members 210, 230 as the reflective ground element similar to Applicant's invention. Applicant disagrees with this

assertion, but even were the housing members 210, 230 a reflective ground element, Pottala et al. does not show the housing members 210, 230 physically in parallel with and a predetermined distance from the electromagnetic coupling element (240). That is, housing members 210, 230 are not physically in parallel with the electromagnetic coupling element (240); rather, they surround the electromagnetic coupling element (240).

Moreover, the Examiner states that Figure 2 of Pottala et al. shows the electromagnetic coupling element and the reflective ground element in the form of a trough with a U-shaped cross section. Applicant's claim 18 recites that the reflective ground element has a U-shaped cross section being conformal with the cross section of the electromagnetic coupling. As discussed above, Applicant submits that Pottala et al. fails to disclose the reflective ground element as claimed by Applicant. But even the housing member 210, 230 which the Examiner submits is the reflective ground element does not have a U-shaped cross section; rather, as seen in Fig. 3, when the housing member (210, 230) is closed, it forms a circular cross section.

For all of the above reasons, Applicant submits that claims 1-5, 7-10, and 17-19 are patentably distinct over Pottala et al.

Reconsideration is respectfully requested of the rejection of claims 1, 3-5, 7-10, and 17-19 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,668,561 to Perrotta et al.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that amended independent claims 1, 7, and 17-19 are patentable over the cited reference for at least the following reasons.

Perrotta et al., as understood by Applicant, relates to an antenna coupler for use in a mobile adaptor. The antenna coupler transfers RF energy between a portable radio antenna system and an external antenna. The antenna coupler includes a resonator patch and an electromagnetic tuning element forming side walls on a substrate for receiving the portable antenna system. The electromagnetic tuning element controls the impedance between the resonator patch and the portable antenna system while the resonator patch transfers the RF energy between the portable radio antenna and the external antenna.

It is respectfully submitted that the device of Perrotta et al. is different from Applicant's invention as recited in the amended independent claims for at least the following reasons.

Perrotta et al. shows a system different from Applicant's invention. In Applicant's claimed invention, the reflective ground element is arranged adjacent to the first antenna and disposed on the ground conductor element physically in parallel with and a predetermined distance from the electromagnetic coupling element along the first antenna in the axial direction.

On the contrary, in Perrotta et al., the substrate 106 and the conductive shield 108 (what the Examiner refers to as the reflective ground element 106, 108) are not disposed on the ground conductor element physically in parallel with and a predetermined distance from the resonator patch 110 along the first antenna in the axial direction. Rather, the substrate 106 is disposed in a plane perpendicular to the resonator patch 100. And the conductive shield 108 is not disposed a predetermined distance from the resonator patch 100 in the axial direction; rather, the conductive shield 108 is disposed

a predetermined distance from the resonator patch in a direction perpendicular to the axial direction.

Accordingly, Applicant submits that claims 1, 3-5, 7-10, and 17-19 are patentably distinct over Perrotta et al.

Claims 1-5, 7-10, and 16-19 were rejected under the judicially created doctrine of double patenting over claims 1-6 of U.S. Patent 5,777,585.

Applicant will submit a Terminal Disclaimer to overcome an actual or provisional rejection based on a nonstatutory double patenting ground at a later date, if necessary. The amendments made to the claims, however, are thought to take the claimed invention out of the scope of the claims of U.S. Patent 5,777,785.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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JHM/RAD

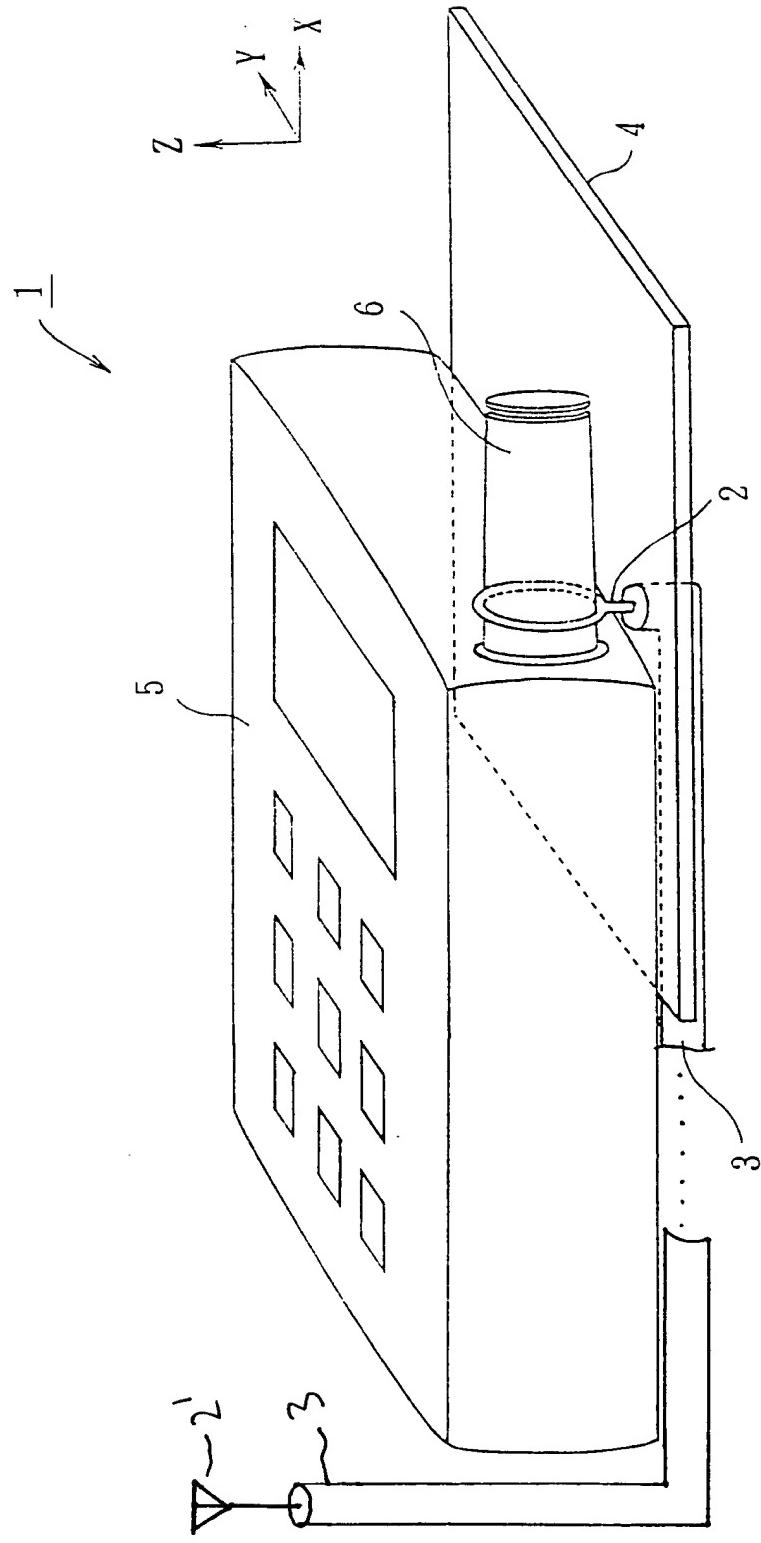


FIG. 1 (RELATED ART)

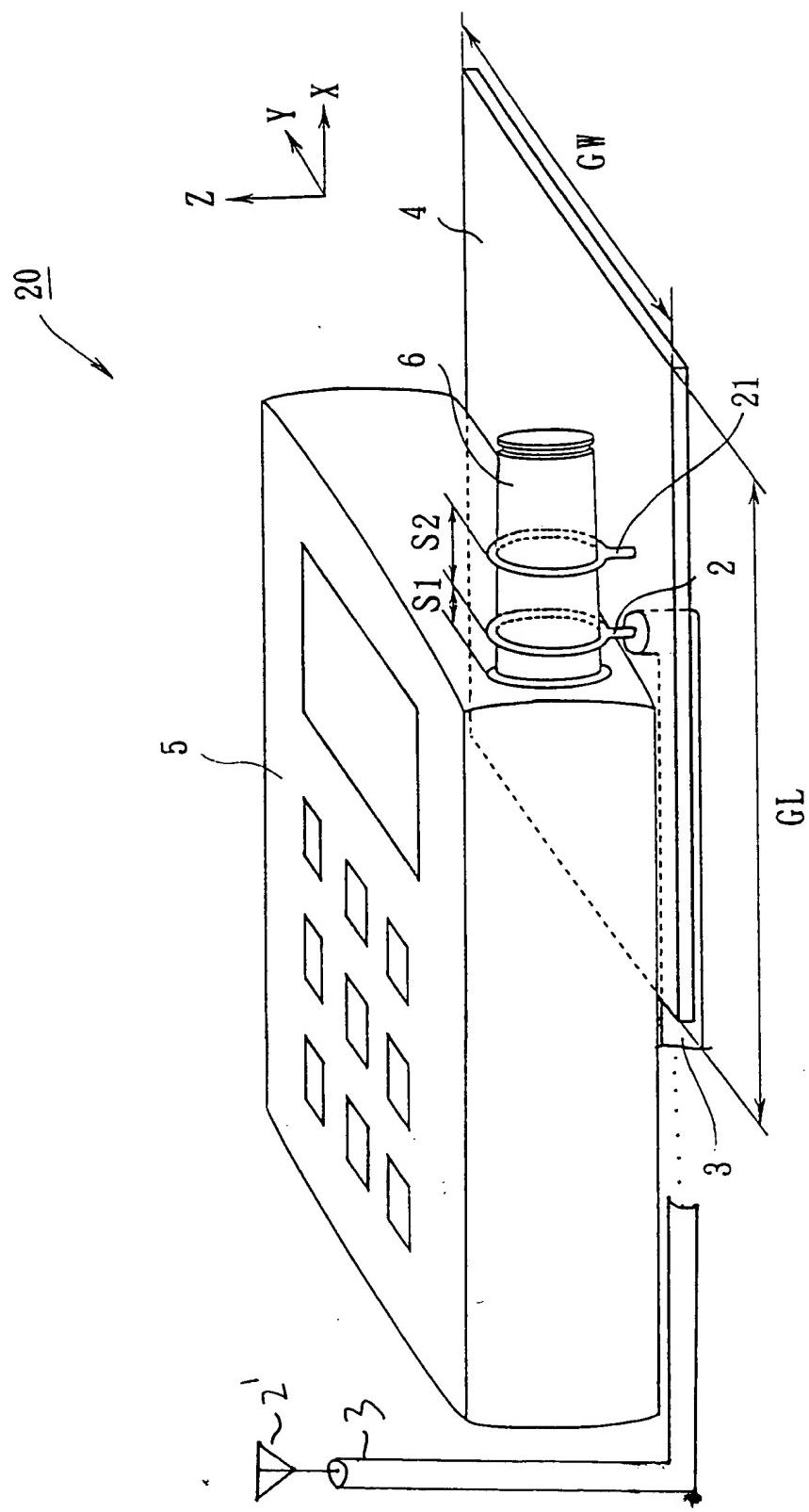


FIG. 4

Approved by
Examiner H. L.
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FIG. 11B

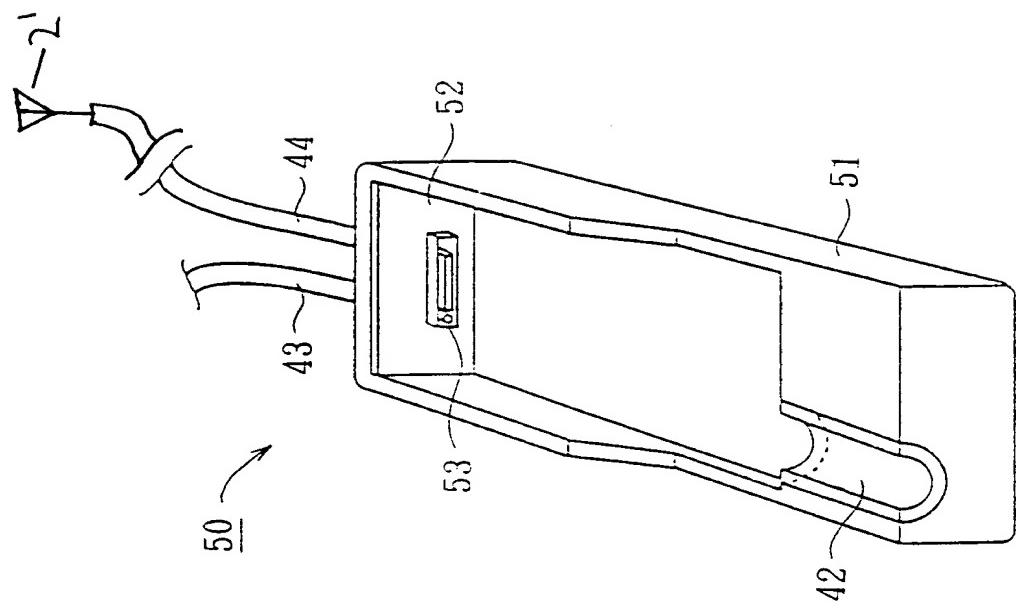
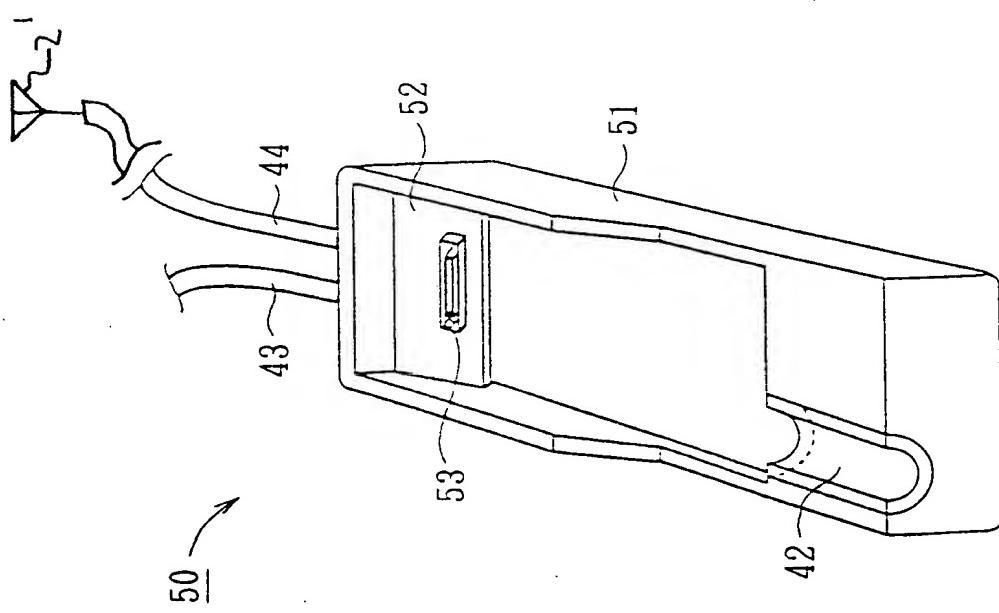


FIG. 11A



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